

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE
February 1999

BUDGET ACTIVITY

6 - Management and Support

PE NUMBER AND TITLE

0604759A Major Test and Evaluation Investment

COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	40256	37030	39380	40190	46661	61572	54722	63817	Continuing	Continuing
D983 Major Test & Evaluation - USAKA	3577	4115	7493	4447	4480	7920	5114	6690	Continuing	Continuing
D984 Major Technical Test Instrumentation	32374	30356	27205	29163	33861	39345	39198	44919	Continuing	Continuing
D986 Major User Test Instrumentation	4305	2559	4682	6580	8320	14307	10410	12208	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program funds development and acquisition of major developmental test instrumentation for the U.S. Army Test and Evaluation Command (TECOM) test activities: White Sands Missile Range (WSMR), NM; Yuma Proving Ground, (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; Redstone Technical Test Center (RTTC), AL; and Aviation Technical Test Center (ATTC), AL; and for the US Army Kwajalein Atoll (USAKA), which is managed by the U.S. Army Space and Missile Defense Command. Program also funds development and acquisition of major field instrumentation for U. S. Army Operational Test and Evaluation Command (OPTEC) test organizations. Requirements for instrumentation are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs required for these systems. Army testing facilities are also surveyed to determine major testing capability shortfalls.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	39200	40284	40265	41961
Appropriated Value	40449	37284		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1249	-254		
b. SBIR / STTR	-936			
c. Omnibus or Other Above Threshold Reductions	-308			
d. Below Threshold Reprogramming	+2300			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-885	-1771
Current Budget Submit (FY 2000/2001 PB)	40256	37030	39380	40190

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment				PROJECT D983		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D983 Major Test & Evaluation - USAKA	3577	4115	7493	4447	4480	7920	5114	6690	Continuing	Continuing

Mission Description and Justification: This project funds the purchase of major Improvement and Modernization (I&M) equipment at the US Army Kwajalein Atoll/Kwajalein missile Range (USAKA/KMR) in the Marshall Islands. USAKA/KMR is a national test range supporting Army, Ballistic Missile Defense Organization (BMDO), US Air Force, National Aeronautics and Space Administration (NASA), and other customers. Upgrades to telemetry, optics, command/control and other equipment are required to maintain USAKA as a national test range. FY 2000 increase supports the Kwajalein Missile Range (KMR) Modernization and Remoting (KMAR) project, which is a concurrent, range-wide modernization effort to maximize the use of common, standardized Commercial Off-The-Shelf (COTS) technology to replace obsolete components; implement common hardware/software architectures and automation; and "remote" the operation of range sensors and instrumentation to the island of Kwajalein. This effort will upgrade range capabilities that are critical to the success of upcoming Theater Missile Defense (TMD) and National Missile Defense (NMD) test missions as well as reduce USAKA/KMR annual operating costs by \$17.7M per year. These savings are already reflected in PE 0605301A, Army Kwajalein Atoll.

FY 1998 Accomplishments:

- 3577 KMR Modernization and Remoting (KMAR) – Completed three major design reviews, Radar design completed, material purchases generated for 2 of 5 radars, robust network architecture design completed. Gellinam Island deactivated, Optics computer upgrades completed at 2 sites.

Total 3577

FY 1999 Planned Program:

- 4006 Continue KMR Modernization and Remoting (KMAR) – Complete purchase of Advanced Research Project Agency (ARPA) Lincoln C-band Observable Radar (ALCOR) and Millimeter Wave (MMW) radar material. Begin installation of ALCOR equipment. Complete remoting of Gagan Island telemetry. Complete optics computer upgrades.
- 109 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 4115

FY 2000 Planned Program:

- 7493 Continue KMR Modernization and Remoting (KMAR) – Complete ALCOR radar modernization. Complete network upgrades to allow full automation of Kiernan Re-entry Measurement Site radar complex at Roi-Namur as each radar system completes modernization. Complete Telemetry Center to allow for relocation of telemetry receive and recording equipment to Kwajalein Island from Carlos Island. Complete mission planning workstation and simulation capabilities to allow for automated mission planning.

Total 7493

Project D983

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<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none">• 4447 Continue KMR Modernization and Remoting (KMR) – Complete ALCOR modernization. Complete Kwajalein Space Surveillance Center. <p>Total 4447</p>		
<p>Project D983</p> <p>Page 3 of 7 Pages</p> <p>Exhibit R-2A (PE 0604759A)</p>		

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment					PROJECT D984	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D984 Major Technical Test Instrumentation	32374	30356	27205	29163	33861	39345	39198	44919	Continuing	Continuing
<p>Mission Description and Justification: This project develops and acquires major test instrumentation to perform developmental testing of weapon systems at U. S. Army Test and Evaluation Command (TECOM) activities which include: Yuma Proving Ground (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; White Sands Missile Range (WSMR), NM; Redstone Technical Test Center (RTTC), AL; and Aviation Technical Test Center (ATTC), AL. Major instrumentation is defined as having one or more of the following attributes: joint-service requirements, multiple command use, high visibility, large dollar value, produces a new capability or requires intensive management during acquisition. The Test Support Network (TSN) at WSMR will provide complete secure coverage of voice, data and video in a single integrated, transport system. TSN will provide advanced encryption capabilities and remote control of switching capabilities for test configuration and total network data arrangement control. The Land Combat Instrumentation (LCI) provides for upgrade and expansion for ATC's suite of instrumentation required for performance testing of combat and tactical vehicles, advanced armor, and advanced munitions. The Fiber Optic Network (FON) provides ATC instrumented test areas with high-speed communication links to other test and central data processing/evaluation facilities. The Frequency Surveillance System (FSS) will provide remote capabilities to daily operations of radio frequency spectrum surveillance at WSMR in support of all Service and non-DoD agency tests. The Dynamic Infrared Scene Projector (DIRSP) will conduct performance testing of night vision sensors and Infrared (IR) imaging seekers at RTTC, and will provide the capability to fully simulate and synthesize present and future battlefields with a mix of real and simulated objects. The Hardened Subminiature Telemetry and Sensor System (HSTSS) is developing, miniaturizing, and hardening an instrumentation/telemetry package at YPG that will provide continuous direct measurement of internal functioning and flight data for cannon-launched munitions, smart submunitions, and small missiles/rockets. The Range Digital Transmission System (RDTSS) will improve test operations and will reduce test costs allowing for efficient data collection and remote operations at YPG. The Mobile Infrared Scene Projector (MIRSP) project will conduct performance testing of infrared IMAGING and FLIR sensors while installed on the weapon system under test at ATTC.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1375 Completed installation of fiber optic data link for FON at ATC. Also completed securing of the FON. • 12405 Completed installation and acceptance testing for the first subnet of the WSMR TSN and initiated the system integration and testing (software qualification) which will support the Initial Operating Capability (IOC) of the WSMR TSN. Completed installation of Phase I of the Eastern Fiber Optic Network backbone. • 2172 Continued installation of Automotive Communication Network at ATC Churchville test area. Continued LCI range instrumentation and started Direct Fire Imager development. • 10438 Continued installing, integrating, testing and performing site acceptance of FSS network communication equipment located at the control center and three remote sites at WSMR. • 3453 Started fabrication of full up system, started system integration, and subsystem testing for the DIRSP project at RTTC. • 2106 Awarded EMD transmitter Development Contract for HSTSS instrumentation. Released request for proposal for Data Acquisition Chipset (DAC). 										
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<p>FY 1998 Accomplishments: (continued)</p> <ul style="list-style-type: none"> • 372 Started MIRSP Phase I tradeoff analysis and design. • 53 Completed development of the statement of work and system specification for the RDTS at YPG. <p>Total 32374</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 10727 Complete WSMR TSN Phase I to include installation and acceptance testing to support IOC. Install breakout and feeder sites to support WSMR TSN Phase II. Achieve Milestone II decision approval. • 1938 Continue installation of Automotive Communication Network at ATC Churchville test area. Complete LCI range instrumentation and Direct Fire Imager. • 6020 Install, integrate, test and perform site acceptance of WSMR FSS at the Holloman control center and Higbie and Sacramento Peak remote sites. Purchase, integrate, and test FSS equipment for Ft Bliss, TX and Kirtland AFB, NM remote sites. • 3275 Complete DIRSP system integration and testing to meet IOC and field system to RTTC. • 5651 Continue development of HSTSS instrumentation for YPG and start acceptance testing of key components. • 856 Complete RDTS acquisition strategy; institute Engineering Design Plan to include engineering drawings and site survey report. • 1108 Complete MIRSP Phase I preliminary and final designs. • 781 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 30356</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 15086 Continue WSMR TSN Phase II to include fiber optic service extension and additional network/subnetwork capability. • 6181 Continue development and acceptance testing of HSTSS components. • 2922 Complete YPG RDTS telecommunications installation plan and the telecommunications systems engineering plan. Award RDTS integration contract. Initiate installation of digital fiber optic cable to support Phase I of RDTS for the YPG West Kofa test ranges. • 3016 Complete MIRSP Phase I system fabrication, integration and testing at ATTC. <p>Total 27205</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 18888 Complete WSMR TSN Phase II system integration. Initiate Phase III to include extension of fiber optic service to additional WSMR test sites. • 3168 Complete HSTSS development and achieve Milestone III decision for HSTSS production. • 5772 Continue installation of digital fiber optic cable to support YPG RDTS Phase I. 		
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•	1335	Complete verification, validation, accreditation and fielding to ATTC of MIRSP Phase I (prototype). Initiate development of MIRSP Phase II, (the fullup system).	
Total	29163		

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment				PROJECT D986		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D986 Major User Test Instrumentation	4305	2559	4682	6580	8320	14307	10410	12208	Continuing	Continuing

Mission Description and Justification: This project finances the development of major field instrumentation for Operational Testing (OT), Force Development Testing and Experimentation (FDTE), and Army Warfighting Experiments (AWE) for the U.S Army Operational Test and Evaluation Command (OPTEC) which includes test directorates at Fort Hood, TX, Fort Bragg, NC, Fort Sill, OK, Fort Bliss, TX and Fort Huachucha, AZ. Each initiative set forth in this program is directly tied to tactical systems that support each of the five Army Modernization Objectives: Project and Sustain; Protect The Force; Win Information War; Conduct Precision Strikes; and Dominate The Maneuver Battle. Cornerstone of this effort is the Mobile Automated Instrumentation Suite (MAIS) which provides users a high fidelity, realistic, real-time capability to measure the performance of hardware and personnel under tactical conditions for large-scale operations (up to 1830 players). The MAIS will instrument combat systems in the operational forces to provide encrypted Real Time Casualty Assessment (RTCA) and Time, Space, and Positioning Information (TSPI) data. The MAIS system and its data are the tools that will enable objective assessments for new materiel acquisition, force structuring, doctrine and tactics modification, and, through the High Level Architecture (HLA)/Distributed Interactive Simulation (DIS) Protocol Data Unit (PDU) format, provide data to validate the future DoD warfighting models and simulations, bridge the test analysis centers, and link multi-Service test and training exercises. The MAIS, an ACAT III program, was approved for Milestone III in February 1998. Current program (one control center and 131 player units) achieved Initial Operational Capability (IOC) in December 1997. One additional control center and 469 player units are programmed in Other Procurement, Army. A MAIS Pre-Planned Product Improvement (P3I) program was initiated in FY 98 to provide MAIS interfaces with new and existing weapons systems such as the Longbow Apache helicopter, Comanche, Crusader, Bradley Stinger, Javelin/Surrogate Weapon Interface, Precision Guided Mortar Munition, and the Objective Individual Combat Weapon. MAIS P3I provides insertion of enhancements to the RTCA algorithms; simulation of Opposing Force (OPFOR) weapon systems and player units for newly acquired weapon systems; and development of player units for new weapon systems. These core system enhancements are required as part of the basic program enabling the operational test community to effectively emulate current and future battlefield weapons in a high fidelity environment. Weapon system unique MAIS components are funded by the weapon system program. The P3I program will develop and integrate additional weapon system interfaces and capabilities to improve the fidelity and robustness of the MAIS system.

FY 1998 Planned Program:

- 3755 Completed system Developmental and Operational Testing for MAIS and achieved Milestone III. Continued MAIS product refurbishment to eliminate component obsolescence for production. Designed, developed, and implemented the MAIS P3I program, specifically Dismounted Troop miniaturization and the Digital M1A2 and M2A3 system interfaces, critical to conducting realistic weapon system operational testing and force development testing.
- 550 Completed the Mobile Integrated Non-Intrusive Command, Control and Communications Instrumentation (MINI C3I) which provides audio, video, and digital information required for credible testing of C3I systems.

Total 4305

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<p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2512 Complete the Dismounted Troop miniaturization design, development and testing in preparation for production. Design, develop and prepare for the Production of the MAIS Weapons Performance Module (WPM) which miniaturizes the remaining MAIS functionality and secures cost savings resulting from decreased production and life-cycle support costs. Initiate development of a reconfigurable interface/controller that allows MAIS to use the training community's surrogate weapons. Complete the design, development, and implementation of a MAIS-MILES interoperability capability. • 47 Small Business Innovation Research/Small Business Technical Transfer (SBIR/STTR) Research. <p>Total 2559</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4682 Continue to execute the MAIS P3I program, specifically to initiate the development of core system algorithms and interfaces for existing and emerging weapon systems. Initiate the development of Chemical Detection Alarms, Weapon System Software Upgrades, After Action Review capability, and a Test Officer's Training Station. Implement Weapon System Software Compatibility Upgrades and an Automated Indirect Fire Execution capability. Complete development of the MAIS reconfigurable interface/controller. <p>Total 4682</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 6580 Continue MAIS P3I core weapon system interface development for the existing and emerging weapon systems. Complete development of Chemical Detection Alarm, After Action Review, and Test Officer's Training Station. Continue development of the Weapon System Software Compatibility Upgrade. Initiate design and development of the MAIS P3I Wearable Computer. <p>Total 6580</p>		
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